

A Work Project, presented as part of the requirements for the Award of a Master Degree  
in Finance from the NOVA – School of Business and Economics.



Work Project – Direct Research Internship

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EVALUATION OF THE MAIL DELIVERY SOURCING STRATEGY IN EDP:  
SAVING COSTS VS EXCELLENCE QUALITY PROVIDED DECISION

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January 2019

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## **1. ABSTRACT**

The choice of a company to perform a service that impacts the core operations of a firm can affect the effectiveness of the business and be a major driver for success. In addition, defining a good system to check the performance of the chosen external service providers improves the chances of success. This research paper has the objective of studying what should be behind this important decision, what are the factors to considerate in this choice, how should the service providers be evaluated along the way, what should be the strategy in the sourcing decision. Using as example a company like EDP and its outsourced service of mail delivery, the paper gains even more relevance and constitute a practical view of what happens in real life business. The main findings of this dissertation suggest that a multiple-sourcing strategy, with the allocation between the service providers being decided in consistency with the performance assessed at the time of decision, is the most suitable for EDP, with quality associated being the principal driver of the choice.

**KEYWORDS:** EDP; Sourcing; Evaluation; SLA

## 2. INTRODUCTION – OVERALL CONTEXT

All the good stories require some context, and this research project is no different. For that purpose, I would like to start by explaining the macro environment where all this dissertation had origin. EDP, Energias de Portugal, is a multinational utility company and one of the largest business groups operating in the energy sector in the Iberian market. It is becoming also a very important player in the renewable energy sector. EDP is present in 14 countries in different continents, providing electricity and other services to almost 10 million customers. EDP is consider the third largest electricity production company and has around 12,000 employees. The main products and services offered relates to the electricity and gas commercialization activity, along all the value chain. The company was established in 1976, with the state support, and with the major goal of increasing the use of electricity in Portugal. Since then, it has become the top player of the sector and a remarkable firm with national and international prestige.

Nowadays, EDP is a private company, trading on the EURONEXT LISBON stock exchange with a market cap of 11.3bn EUR as of December 2018. In terms of ownership structure, EDP has a stable and diversified group of shareholders, being the People's Republic of China group CHINA THREE GORGES CORPORATION the major one (it has around 24% of ownership and consequently voting rights). Looking at other data, it had FY2017 revenues of 15.7bn EUR and an EBITDA of 4.0bn EUR. EDP competitors are other multinational energy firms like IBERDROLA or ENDESA, that also operate in the Iberian market. As it was said before, EDP is spread worldwide, with more evidence in Brazil, Spain and North America, despite of course Portugal. Focusing on the operation itself we could say that EDP coverage all the energy value chain: from generation to the distribution and finally its commercialization. But along the process EDP works with many suppliers and partners that support and levered the operation. All these external

agents have a crucial role in the effectiveness of all the operations. This support my idea to search and study better the suppliers EDP has and understand their importance inside the organization. Since EDP is a large company and so dealing with many and completely different suppliers and partners, I decided that I should focus in a specific task and in the suppliers and partners associated. I also realize that I could take advantage of my privilege situation at that time. I was doing an internship in EDP and I would be dealing with suppliers and partners in my day to day work. I would be having actual know-how about what was happening in reality, which could be important when trying to reach conclusions. I also understand my department had the desire to conduct a study about a group of suppliers of a specific sector to determine if anything should be change or not. The sector that I am talking is the postal sector (mail delivery). This will be the segment where I will focus my dissertation.

Suppliers and partners are without any question an important factor for any business. They allow the company to focus on other areas where it has a competitive advantage without jeopardizing the effective “flow” of the operation. The idea of doing a master thesis about suppliers, their role and the criteria behind their choice appear mainly because of the work I was doing at that moment, like I said before during an internship at EDP, more precisely at EDP Soluções Comerciais (EDP SC). EDP SC is a shared-services company inside EDP group, with services that go from optimization and supervision of IT platforms to management of the partners the company has. The latter was the area where I was working on, being “Gestão de Parceiros” the name of the department. My team was responsible for everything that relates with EDP partners, so our work was to control and audit the quality of the service provided, check the end of the month billing and manage all other issues that emerge from the relationship. In EDP case, it is normal that for each specific service, there was at least two different partners. This happens in all

the different services my department work with, like the printing of the documents, the management of the stores or the mail delivery.

Since the beginning I start realizing that each partner within a specific segment had its own characteristics, having advantages and disadvantages along the process. Talking with my supervisor it was considered interesting and very useful for the department and EDP itself if a study was conducted to check if the choice of each partner for each specific service hired did make sense at the current days. The service where the analysis could make more sense and was in real need of assessment was the mail delivery, where there was 2 players operating. For privacy reasons, it was decided that the real name of each player would not be revealed, and so I will call them Company C and Company P for no particular reason.

The mail delivery is a vital service for EDP operation. Despite being an area that do not relates to the production, distribution or commercialization of energy (core activities of EDP), it is a service that connects the company with its clients. It is via mail delivery that clients get access to their monthly bill (and so the direct way to collect the payments), get information about campaigns and new products (one of the channels for EDP's marketing), among many other important announcements the firm wants to communicate. For this reason, it is a service that must be carefully tracked by EDP, particularly in this case since it is done through an external service provider, in a Business Process Outsourcing (BPO) Model that will be discuss later.

When dealing with the postal sector, the key factor relates to timings and costs. Basically, the desirably was to have a partner that could deliver every document and the pre-established time for the lowest cost possible, maintaining a quality service along all the process. Looking from a general point of view, it could be said that each of the two players

have only one of the drivers as a competitive advantage: while Company C has a quality service but is more expensive, Company P works for a lower price but don't guarantee the same quality of service provided. The idea that now must be discuss is what makes more sense for a company like EDP: have a quality service in the mail delivery with higher costs associated or bet on an apparently inferior quality service but that allows for savings at the end of the year.

This paper will discuss what should be the best strategy when deciding what service providers to choose from. With access to privileged information from the documents used in the management of this operation there will be interesting conclusions to be debated. The data used is factual and give strong support to the results that emerged from the analysis made. Also backing with all the literature already publish about the subject and other related concepts, this dissertation concludes that the quality of the service provided is the most important driver for EDP, although costs are also an important factor when deciding to whom should the service be allocated. Moreover, the paper will prove that selecting a multi-sourcing (more precisely dual-sourcing) strategy by EDP was the best option for the firm context. The idea is to balance the allocation of the service between providers to have a strategy that could maintain the excellence quality in the service with a controlled level of costs. The exact percentage should vary depending on the performance presented along the time, having SLA indicators as criteria.

### **3. LITERATURE REVIEW**

In the business world, company's success does not depend exclusively in the effectiveness of its operations and profitability. Many other factors can be drivers of the success of a company, especially the work other "players" like suppliers and partners that

work in collaboration with the firm have. No matter the size of the company, what is becoming the norm is for businesses to move towards specialization rather than multi-operations. Firms will focus on what they have a competitive advantage and therefore put all the efforts and emphasis in core activities. But any business does not work simply with its in-house operation. There are complementary products and services that are vital for the operation to work effectively. These auxiliary or external components are performed in most cases (and following the idea of focus on specialization by firms) by other companies, entitled suppliers or partners. For that reason, the external players are becoming to have a more important role in what concerns operations.

This idea of transferring activities that are important for firms' operations to an external player is becoming more usual. Sourcing intends to maximize the operation effectiveness and reaching the best strategy to deliver a certain task or service to the most suitable player or players for the need.

The mailing delivery applied to a company like EDP with millions of clients is too big and complex to keep indoors. Although a vital service for EDP's operation it cannot relates to the other core activities of the group, where EDP has in fact expertise and competitive advantage. This concept of having the best players doing activities where they have the know-how leads to quality improvements, cost savings and so a better service for the ultimate clients (Gewald. H et al. 2009). Each firm should establish some sort of control to check at each point in time if the service hired is being well perform, what might be going wrong or improve some other aspects. To ensure the quality is important that it is defined an evaluation metric of performance. This performance levels are defined when designing the contract and are commonly known as Service Level Agreements (SLA). They are defined along with the companies hired to do the service since it is something that will benefit both sides. From the company who hires the service



there is a clear set of numbers that will help in the evaluation process and in better understanding how in fact the service is being done; in the service provider side, it clarifies what is expected from them, helping the allocation of responsibilities, reducing future problems and improving the communication between both sides (Goo et al, 2006). Although it is a subject that does not have much academic attention, the definition and implementation of SLA's between two parties in a service contract contribute a lot for a productive relation. When celebrating a contract is important to make commitments and be prepared to comply with what was defined or accept the penalties of the failure. The SLA is becoming a commonly used term in the business world also due to the increased growth in the use of outsourcing by firms. The correlation between SLA and any outsourcing relationship is strong, with all outsourced services being defined by an SLA. The implementation of this metric is important to make the relationship more flexible, allowing to company who hires a service to better control the performance, better outline what are its requirements (Beaumont, 2006).

Until now it was discussed the way to allocate a specific service and how to secure its quality performance. But should the service be done by only one company? Or should it be divided for more than one player? This are legit questions and demand some debate. Giving names to both arguments, it could be said that the hired service could be done with single sourcing or multi sourcing. Among the community there are people who argue that single sourcing is the best option since it reduces coordination costs and could benefit from volume discounts, while other believe multi-sourcing is better since there is less dependence on a single provider and could be an advantage to have the better price due to the competition. The question about how many suppliers are best is common; however, the answer is not clear. The strategy of multiple-sourcing clearly put all suppliers against

each other, gaining probably the most competitive price but maybe losing the possibility of developing long-term partnership that could be useful.

In fact, both approaches have advantages and disadvantages. However, the latest results in supply chain management have favoured the use of only a few suppliers (single-sourcing should also be considered) to coordinate better the operations, a factor that is relevant in these relationships (Berger, Gerstenfeld and Zeng, 2004). There had been evidences that focusing on a few sources could be the best strategy (Spekman, 1988; Pilling and Zhang, 1992). Other research showed that with single-sourcing there would be quantity discounts, better response in terms of timing and cost reduction in logistics of monitoring a big supplier base (Hahn, Kim and Kim, 1986; (Bozarth, Handfield and Das, 1998). Most of the benefits recognized with single-sourcing are related with performance. This quality factor of using few sources is claimed to be more useful to the companies than the price reduction of having an intense competition in multi-sourcing (Mohr and Spekman, 1994).

On the other hand, there is also support for multiple-sourcing as the best approach. Researches show that the effective relation used as argument in favour for single-sourcing is only achieved with high level of trust and experience (Bhote, 1987). This may only happen within a long interval of time, time that most companies do not want to risk losing. Other relevant point is the installed capacity the service suppliers have to offer. Single sourcing (or a few sources) can only be considered when the company providing the service is big enough so that the service is not put in risk (Burke, Carrillo and Vakharia, 2007).

The evaluation factor is also important, concerning a potential future relation with a service provider. Criteria can be defined in many ways, but what is indicated is that it

follows 6 categories: quality, cost, delivery, management, organization and trust (Chu and Varma, 2012).

In the end, the main goal is to choose a strategy that best fits each organization. This is being classified as strategic sourcing. The idea of strategic sourcing has changed over the years. Before it was focused on cost reduction and better management of the service providers. More recently, factors like flexibility, information integration and forward-looking (technology) have gain importance in this attempt to characterized strategic sourcing. Research projects conducted still reveal that cost/price, delivery time, and quality are always the key strategic supplier evaluation criteria to consider. Quality is in fact the one that is chosen as the most important, independently of the industry or country, looking at a general perspective. If the idea is to follow a more strategic approach then, cost/price is considered the best evaluation criteria. Either way, studies are limited in demonstrating strategic sourcing practices in real situations, specific industries or countries (Kotula et al., 2015). Proved is the impact the selection process has in gaining competitive advantage and how the business performance is influenced by strategic sourcing (Su et al, 2009). Finally, there has been recent studies that indicate dual sourcing is the best strategy to be applied in most conditions involving the companies (Jain and Hazra, 2017).

## **4. METHODOLOGY**

### **4.1 Topic decision and Thesis objective**

The idea of conducting this dissertation was a combination of EDP's (my department in particular) interest in studying further this subject and a personal desire to do a research project that would be useful and unique at the same time. The fact that I would be working

daily with the topics in question was another argument that made me decide for this option. Although, the sourcing problematic, and all the issues that could derive from it, is a regular theme discussed in many dissertations across the recent years, there is not many studies that analyse the situation using a real case, like it would be possible to do in this research project.

Describing the objective of this dissertation would be to say, by the end of it, what is the performance of the external mailing delivery service providers in reality and a possible solution about what strategy should EDP follow in the future.

#### 4.2 Research method – Plan and Steps followed

This research project was conducted with the idea of adding value to EDP. Therefore, it was decided that it should not only have a qualitative research but also a quantitative approach. EDP wanted the best analysis possible, so authorized the use of private information with the notice of not publishing all the exact numbers involved neither the real names of the partners in study. The period of analysis focus on months that included my time working at the department precisely between the 1<sup>st</sup> of March and 1<sup>st</sup> of December (I have started my internship in June and have stop the data collection in December to have time to analyse properly all the material at my disposal).

To perform the most coherent and organize work it was design a plan with clear steps that help me have a better perspective of what would be necessary to have a good analysis and reach a conclusion. It started by understanding how the business was established, the relation EDP had with both players and what were in fact the competitive advantage of each one of them. Then I looked for information about what would be the main drivers to consider in the evaluation of the external service providers, in this case the most suitable for the mailing delivery industry. Having this in mind I gathered data about the chosen

criteria and start comparing both “providers”. When doing this assessment, I had in consideration the specifications of a company like EDP, the market where it operates and the degree of importance the postal industry has for the value chain of the company. In the end, with this plan in mind and supported by all the theoretical research done, a suggestion of a suitable solution was made.

The use of good arguments is essential to justify your opinions and recommendations. Any dissertation to be valid and appropriate should contain both theoretical and practical foundations. Therefore, the final outcome should be a combination of all the information that was recovered from the reading of scientific articles about the subject in discussion and the data that was recovered from the objects of study and EDP itself. In terms of academic research, the idea was to look for papers that talked about the subject or at least where there could be some useful information that could improve the perception of the concepts used along the investigation process. Regarding the information collected from the operation it was mainly a combination of observation, inquiries and data analysis. It was used external and internal documents and the people questioned work or had worked with the subjects discussed in this research project. Concerning the observation stage, I was present in meetings with the partners where it was discussed key indicators for their overall evaluation, like SLA assessment metrics, operations implementation or potential price change in future contract negotiations. This fact allows me to better understand the concepts I would be dealing with but also where could be changes to improve the process. With this plan design and the path defined I was able to start reaching some conclusions regarding what strategy should EDP follow when deciding how to allocate its demand in the mailing process.

## 5. RESULTS

The idea of doing this thesis was to understand the best strategy in terms of sourcing allocation (in this case in what concerns mailing delivery) and to help EDP in particular to understand how was the service being performed and if there should be any changes either to reduce cost or to improve the quality. It is time to look at what is happening, calculate the results and analyse them.

Like it was said before, EDP now has two companies that are responsible for delivering the documents the firm wants to distribute: Company C and Company P. Going back in time, previously EDP had only one firm doing this service for them that was Company C. Although in terms of quality Company C had good results (meaning levels of SLA above what was contractually defined as the minimum) it also had some problems. The first of them was the high price it charges, that necessary had a huge impact in the end profit of the all business. It is important to remember that the activity of mail delivery, even though is not a core one of EDP, is crucial for the firm since it is the main way to collect customers payment and communicate with its clients. Bearing this in mind, if the cost associated with the mail delivery were reduce, the profit margins would increase. Reducing the cost EDP has with this outsourced service must be an objective especially in these times were the competition has increased in the market. The fact that before Company C was the only source for this service reduce the bargaining power of EDP that constitute another problem of having only one company doing the service. EDP decided then that it would do a poll to the market, searching for potential new suppliers that could do the same type of service but at a lower price, hoping it could maintain a certain level of quality (ideally the same Company C provided). The quality issue is not something to rule out or to consider secondary. EDP is an important company in Portugal, one of the most iconic ones, with millions of clients, that demand and deserve the best quality

service. Also the energy sector is highly regulated. There is a lot of control with special focus in the quality issue, with the regulators demanding a low level of complaints. Having this perception, EDP launch a contest to the market and eventually Company P won. Now EDP has two firms that are ready to work for them, Company C and Company P.

It was now time to discuss how would EDP split the volume of mailing between both partners. Should it be 50/50? Should Company P receive more than 50%? Will this reduce a lot the cost? Or should Company C maintain the majority of deliveries, assigning only a small percentage to the new partner? All these questions needed to be access and answered.

The first thing that we should focus should be the cost reduction. Company P ask for around half the price for each document deliver. Talking concretely about the price, Company P charge a price of between 0,1€ and 0,4€ while Company C charge a price between 0,2€ and 0,5€. Again, for confidentiality reasons I decided to give just price intervals to assure private information is not widespread to the public.

After some deliberation, it was decided that EDP would distribute the mail delivery with the following strategy: around 90% for Company C and the other 10% to company P. This strategy is being applied until now, without any study been done recently to approve it is the most accurate and best one to be implemented. The issue of evaluating all the strategy and change (or not) the distribution behind it gain relevance after some months where the number of complaints and the SLA calculated were below what was contractually defined as the minimum value to be reached.

It was the right time to act. The first thing done was to start looking at the past performances to check if there was a tendency. Company C did not allow EDP to evaluate

its operation and therefore the information was limited. For Company P, EDP could check how they were performing in terms of Service Level Agreement compliance daily since a document was sent to my department every day with data reporting the service performed at the day. Basically, for both companies there was access to quantities delivered and the cost charged monthly (Exhibits 1 and 2).

*Table of total quantities and total cost in mail delivery services of EDP from January-October 2018*

<b>TOTAL</b>	January	February	March	April	May
TOTAL Quantities	3.602.683	2.862.604	4.099.888	2.823.890	4.564.148
TOTAL Costs	1.122.246	872.997	1.232.833	952.039	1.648.018

<b>TOTAL</b>	June	July	August	September	October
TOTAL Quantities	4.182.327	3.445.725	3.426.413	3.111.620	3.710.528
TOTAL Costs	1.316.868	1.122.320	1.130.259	1.008.266	1.187.518

In addition, from this investigation, there could be analyses regarding Service Level Agreements compliance (only for Company P) and the complaints. The information that was given concerning complaints was the motive and the location where it happened. The location was given by the 4 first digits of the postal code (CP4) and so it could be traced to check what company was performing the mail delivery in that area. But sometimes is not possible to understand which company performed the mail delivery that had the complaint because both companies might operate in the same postal code. It was assumed that due to the quality and experience that company C had showed in the past, all complaint that were reported in a CP4 where both companies operate would be linked to company P. This was an assumption decided by the team and that although might be too severe (and sometimes unfair) for company P was considered the most appropriate due to the historical (good) record company C had.

At this stage is relevant to state what SLA was being considered for the evaluation of the performance. It was contractually defined that company P should have a % of mail



delivery with success of at least 96%. The success term in mail delivery does not only consider the effectiveness of the mail deliver at its correct destination. Also, the time factor had importance too, with the SLA defined taking in consideration that, in order to be consider a successful delivery, the mail should be distributed within 2,5 days after it was at the company P possession. The definition of the SLA at the minimum of 96% of successful delivery for company P was a consequence of what was being practice at company C. The idea was to have the same conditions for both service providers, even if they had to operate considerable different volumes of mail.

Looking at the numbers of 2018, EDP had, on average, 3.5M mail deliveries per month that implied cost of around 1.2M per month. Like it was said before this mail delivery service was divided in 90% to company C and 10% to company, with the quantities and cost at the same proportion. It was clear that the fact that most of the mail deliver was done via the company that charged the higher price (company C) elevated a lot the cost. To test what would be the best strategy to implement in the future in terms of cost reduction, it was done a simulation where the weight attributed to each service provider would vary, assigning more percentage to the company that charged the lowest price per unit. This way, it would be possible to realize how much could EDP reduce the cost and check what would be the perfect combination, remembering that quality of the service cannot be jeopardize.

Doing a simulation of assigning different percentage from the ones currently in place (90% company C and 10% company P) the cost savings that come out were impressive (Exhibit 4). In general terms, it could be said that for each 20% that was moved from company C to company P, EDP had a reduction in cost of around 10%. Going to an extreme case, if all the mail delivery was performed by company P then EDP would only have costs of 640k, with savings of around 520k. If price would be the only factor, it was

clear what strategy should be followed: give more volume to company P. But quality of the service provided is not being considered and, as it has been seen, it is also a vital aspect. Quality could be in this specific context the most important factor, much more than price.

Looking for the year 2018, it was clear which company was underperforming in terms of the quality of the service. Although there were not clear quality results for company C (because EDP was not allowed to check their operation), there was no motive to worry and everything was according to what was normal. On the other hand, company P had not been able to comply with the 96% minimum defined SLA in some months of 2018. Why has it happened? It was believed that the bad service started to happen after company P had a weight higher than the initial 10% (approximate) of mail delivery initially defined. In fact, it was in the months when it had some of its highest volumes of delivery, that the service quality started to be at risk. These values should be analysed also taking into account the volumes associated since we are dealing with a supplier that might have restriction in terms of capacity. My thoughts were to consider low results in months when the mail volume had been higher and better ones when they were in accordance to what was the norm. Surprisingly this was not what has happened. Company P had had months where it did not comply with SLA without having an increase in the mail volume for that specific month, making this reasoning not be considered. The situation is even more strange since there were months with increase in mail volume that had also an increase in the % of successful deliveries. The argument that failures in the compliance with SLA could be a result of big volumes is then invalid. But what is the reasoning for these failures?

The explanation appeared during the process. After the troubling times, in September, EDP decided to make a drastically reduced in the mail volume assigned to company P

and to check in a more detail and complete way the operation. For that reason, the number of CP4 where company P would operate was diminish and a detailed dashboard was created. In addition, every two weeks a report about how was the operation in those 2 weeks would be sent asking for feedback about some less positive situation and what would be the response to solve the problems. Surprisingly (or not), this levered a lot the performance of company P, with the SLA being around 99%. It was clear that what was missing was a better management from EDP side of the operation. The volume increased or not had nothing to do with the decrease in the performance as it was believed in the beginning of this study.

Basically, the results show that company C provides a quality service but is more expensive, while company P charges a lower price but is more unpredictable in complying with the minimums SLA defined. The results have also exposed that a better control of the operation by EDP may solve many of the problems, especially the compliance of SLA's.

## **6. CONCLUSION**

The results collected from the year in analysis gave some insights about what is in practice the mail delivery operation. There is enough evidence that the operation is not perfect and has margin to improve. Company P has had problems in complying with the high standard service EDP requires in all its actions and must have a tight control over its operation. Despite this fact, company P was very important in the dynamic of mail delivery. It allowed EDP to gain bargaining power over company C since now there was an alternative and it had more control at least in some volume of its mailings. This control over company P was important for EDP to understand even better how the system works

and use this recent gained know-how with company C, improving some areas that may not work so well. The fact that from the results it was proven the cause of the decrease in the quality of the service provided by company P did not have anything to do with limitation in capacity (at least it was not the main driver) give confidence for EDP to consider increasing the weight allocated to company P. What must be guarantee is that the deep analysis done over the operation of company P in the more recent months is maintain in the future along with other mechanism of control that may be designed.

The biggest conclusion this research project has reveal is that in terms of sourcing is very important that there is a continuous and rigorous analysis of all the processes along the time, working in collaboration with the service providers. Only with this strong cooperation and coordination of expectation is possible to have a quality service. Nowadays, and considering firms in the same level of EDP, quality is something that must be assure and maintain. Strategic sourcing is more about ways of improving the quality of the service provided rather than simple reducing cost or thinking about new ways of developing the operation in the future. There must be cooperation and regular evaluation, changing the allocation between service providers having in mind what is being the performance at the time.

All in all, EDP should preserve the multi-sourcing approach, trying to move more volume of mail delivery to company P, and so reducing its cost with a supplementary (although extremely important) activity, assuming it will keep with the detailed analysis it has established in the recent times and with the expected improvement of the SLA levels that should follow. With this strategy is possible to maintain the desired high quality demanded but having savings, so important in a market more competitive each new year.

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## 8. EXHIBITS

Exhibit 1 – Table of company C quantities delivered and costs from January-October 2018

<b>Company C</b>	January	February	March	April	May
Quantities - company C	3.445.673	2.600.446	3.731.202	2.510.760	3.940.360
Quantities – company C (%)	96%	91%	91%	89%	86%
Costs	1.093.984 €	825.809 €	1.166.470 €	895.675 €	1.536.984 €

<b>Company C</b>	June	July	August	September	October
Quantities - company C	3.721.879	3.241.160	3.327.713	2.956.802	3.437.185
Quantities – company C (%)	89%	94%	97%	95%	93%
Costs	1.234.908 €	1.085.907 €	1.112.690 €	980.708 €	1.138.317 €

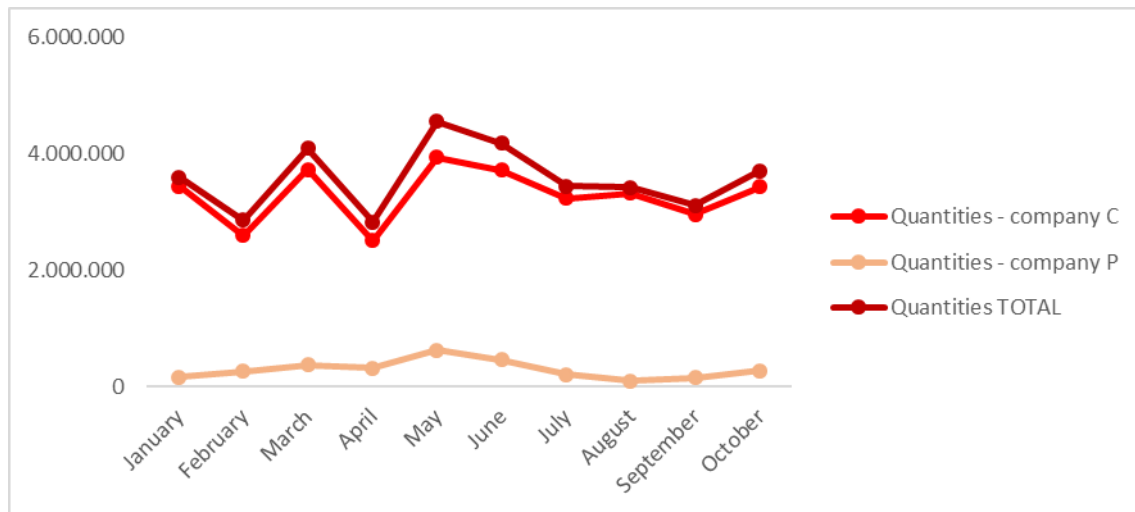
Exhibit 2 – Table of company P quantities delivered, costs and performance from January-October 2018

<b>Company P</b>	January	February	March	April	May
Quantities - company P	157.010	262.158	368.686	313.130	623.788
Quantities – company P (%)	4%	9%	9%	11%	14%
Costs	28.262 €	47.188 €	66.363 €	56.363 €	111.034 €
SLA	96%	97%	97%	91%	93%

<b>Company P</b>	June	July	August	September	October
Quantities - company P	460.448	204.565	98.700	154.818	273.343
Quantities – company P (%)	11%	6%	3%	5%	7%
Costs	81.960 €	36.413 €	17.569 €	27.558 €	49.201 €
SLA	97%	96%	88%	100%	99%

Exihibit 3 – Graph of variation of quantities across time



Exihibit 4 – Table of costs and savings of different allocation strategies between company C and company P

	January	February	March	April	May
<b>100% Company C</b>					
Costs (100% Company C)	1.146.717 €	913.856 €	1.290.294 €	1.000.841 €	1.746.486 €
Savings	24.471 €	40.858 €	57.461 €	48.803 €	98.468 €
<b>20% Company P</b>					
Costs (20% Company P)	1.096.957 €	871.615 €	1.248.348 €	859.827 €	1.389.707 €
Savings	25.289 €	1.382 €	-15.514 €	92.211 €	258.311 €
<b>40% Company P</b>					
Costs (40% Company P)	983.938 €	781.813 €	1.119.731 €	771.240 €	1.246.526 €
Savings	138.308 €	91.185 €	113.103 €	180.799 €	401.493 €
<b>60% Company P</b>					
Costs (60% Company P)	870.919 €	692.011 €	991.114 €	682.652 €	1.103.345 €
Savings	251.328 €	180.987 €	241.719 €	269.387 €	544.674 €
<b>80% Company P</b>					
Costs (80% Company P)	757.899 €	602.208 €	862.497 €	594.064 €	960.164 €
Savings	364.347 €	270.789 €	370.336 €	357.974 €	687.855 €
<b>100% Company P</b>					
Costs (100% Company P)	644.880 €	512.406 €	733.880 €	505.476 €	816.982 €
Savings	477.366 €	360.591 €	498.953 €	446.562 €	831.036 €

	June	July	August	September	October
<b>100% Company C</b>					
Costs (100% Company C)	1.389.551 €	1.154.611 €	1.145.839 €	1.032.704 €	1.230.120 €
Savings	72.684 €	32.291 €	15.580 €	24.438 €	42.602 €
<b>20% Company P</b>					
Costs (20% Company P)	1.273.449 €	1.049.166 €	1.043.286 €	947.436 €	1.129.794 €
Savings	43.419 €	73.154 €	86.973 €	60.829 €	57.724 €
<b>40% Company P</b>					
Costs (40% Company P)	1.142.246 €	941.071 €	935.796 €	849.822 €	1.013.392 €
Savings	174.622 €	181.249 €	194.463 €	158.443 €	174.126 €
<b>60% Company P</b>					
Costs (60% Company P)	1.011.043 €	832.975 €	828.307 €	752.208 €	896.989 €
Savings	305.825 €	289.345 €	301.952 €	256.058 €	290.529 €
<b>80% Company P</b>					
Costs (80% Company P)	879.840 €	724.880 €	720.817 €	654.594 €	780.587 €
Savings	437.028 €	397.440 €	409.441 €	353.672 €	406.931 €
<b>100% Company P</b>					
Costs (100% Company P)	748.636 €	616.785 €	613.328 €	556.980 €	664.184 €
Savings	568.231 €	505.535 €	516.931 €	451.286 €	523.333 €